Summer 2017

the current

abundant wild fish · healthy waters · better California

CALIFORNIA TROUT

FISH · WATER · PEOPLE

SPECIAL REPORT

SOS II: Fish in Hot Water

What a new study by CalTrout and UC Davis Center for Watershed Sciences tells us about the state of our salmonids.

Cover photo: Bill Schimpf

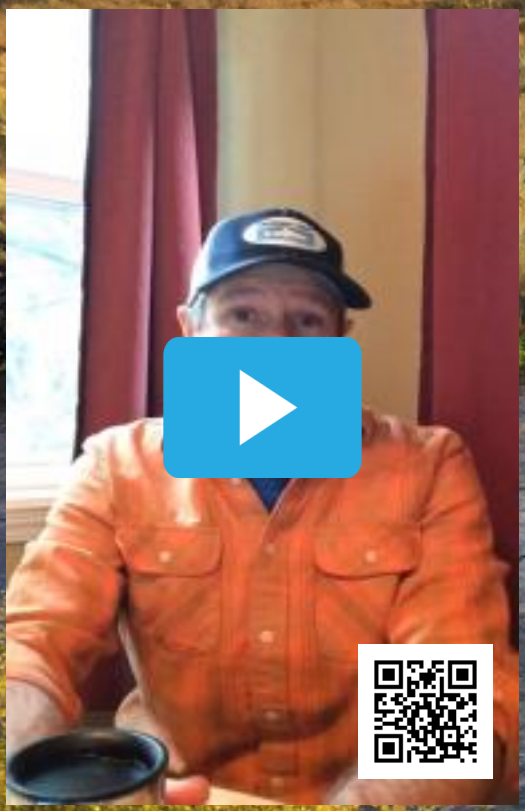
SCOTT RIVER

Water Trust - Partnering to restore this important salmon stronghold

CRAIG'S CORNER

Still snow in the Sierras and a guest appearance from Congressman Jared Huffman

A message to you



Our goal with each issue of *The Current* is to bring our stories and projects to life, with more images, videos and links... offering you a rich perspective on the work **your support makes possible**.

We are thankful to you, our donors, who help us ensure that there will always be resilient populations of wild fish thriving in healthy waters for a better California.

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CalTrout and UC Davis Center for Watershed Sciences released a report detailing the status of California's 32 native salmonids.

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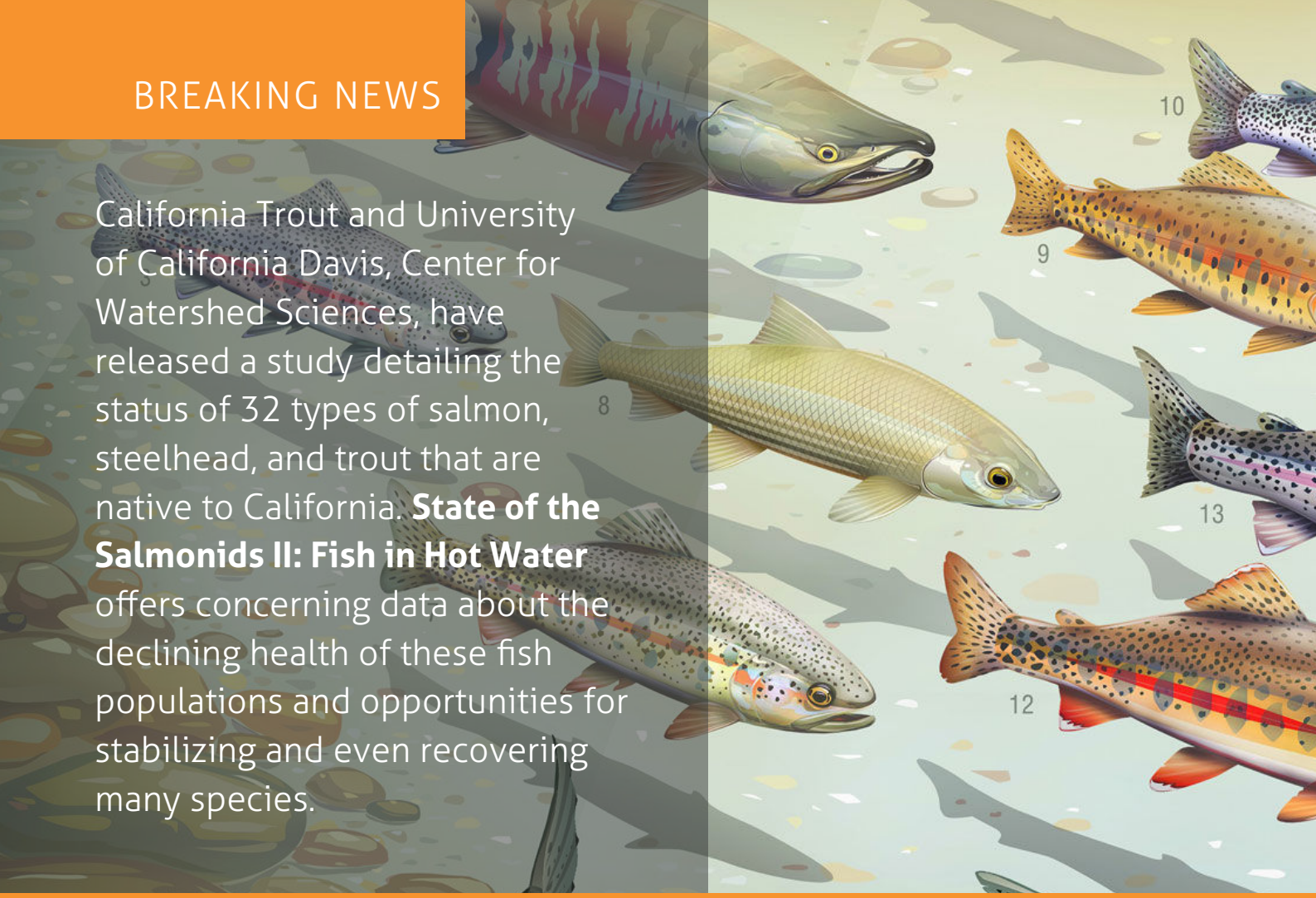


California Trout and University of California Davis, Center for Watershed Sciences, have released a study detailing the status of 32 types of salmon, steelhead, and trout that are native to California. **State of the Salmonids II: Fish in Hot Water** offers concerning data about the declining health of these fish populations and opportunities for stabilizing and even recovering many species.

SOS II: Fish in H

and how we can return them to r

The story the fish tells us is clear. If we don't act, we face losing our native salmon, steelhead and trout species. This would be tragic, not just because we would lose these iconic species, their beauty, their mystery, but as importantly, we would lose what they signify – cold, clean water, healthy rivers, a better California. As a proud Californian, I take this personally.

I care about the legacy I leave to my daughters, and to their children. California is a great state. We're the innovators, the pioneers, one of the most important food-producing regions in the world, and the leaders in technology.

We have unmatched geographic diversity, from an epic coastline to the magnificent Sierra, majestic redwoods to the open beauty of the desert. What would the loss of our native fish mean for who we are?

I am reminded of one of my Stegner, an orator of Californi the 'geography of hope' and opportunity to create 'a socie

Are we up to the challenge? T fish. Its findings lay out a clear s The science, findings and acti CalTrout but for all organizat funders who care about Califo encourage this report being together to reverse the trend California's native salmonids t

The time to act is now. We ha the Bull trout – in 1975. Since

Illustrations by Paul Waters

Hot Water

esilience

Foreward by Curtis Knight, Executive Director, California Trout

y favorite quotes by Wallace
a who referred to the West as
emphasized that we have an
ety to match its scenery.'

his report tells the story of the
et of actions and a path forward.
ons can be a guide not just for
ions, agencies, regulators and
rnia's fish and their waters. We
used as the blueprint to work
toward extinction and return
o resilience.

ave lost one species already –
e that time, California's human
population has almost doubled. The fact that we still have 31 different kinds of salmon, steelhead and trout underscores their inherent resilience. But the recent drought has reminded us how close we are to losing more of these species. For example, the Sacramento River winter-run Chinook was likely only one dry year away from disappearing. Forever. In 50 years, what will California be? What legacy will we leave? Will we still be the leaders, the innovators, the food producers? Will we still have 31 kinds of trout, steelhead and salmon, or will we lose others on our watch?

At CalTrout, we believe the health of these fish is an indicator of the health of our water and of our beautiful state. We can reverse the trend. Together, we can ensure our legacy for future generations by passing on a California whose society matches its scenery.

BREAKING NEWS

The time to act is now. California's unique fishes are

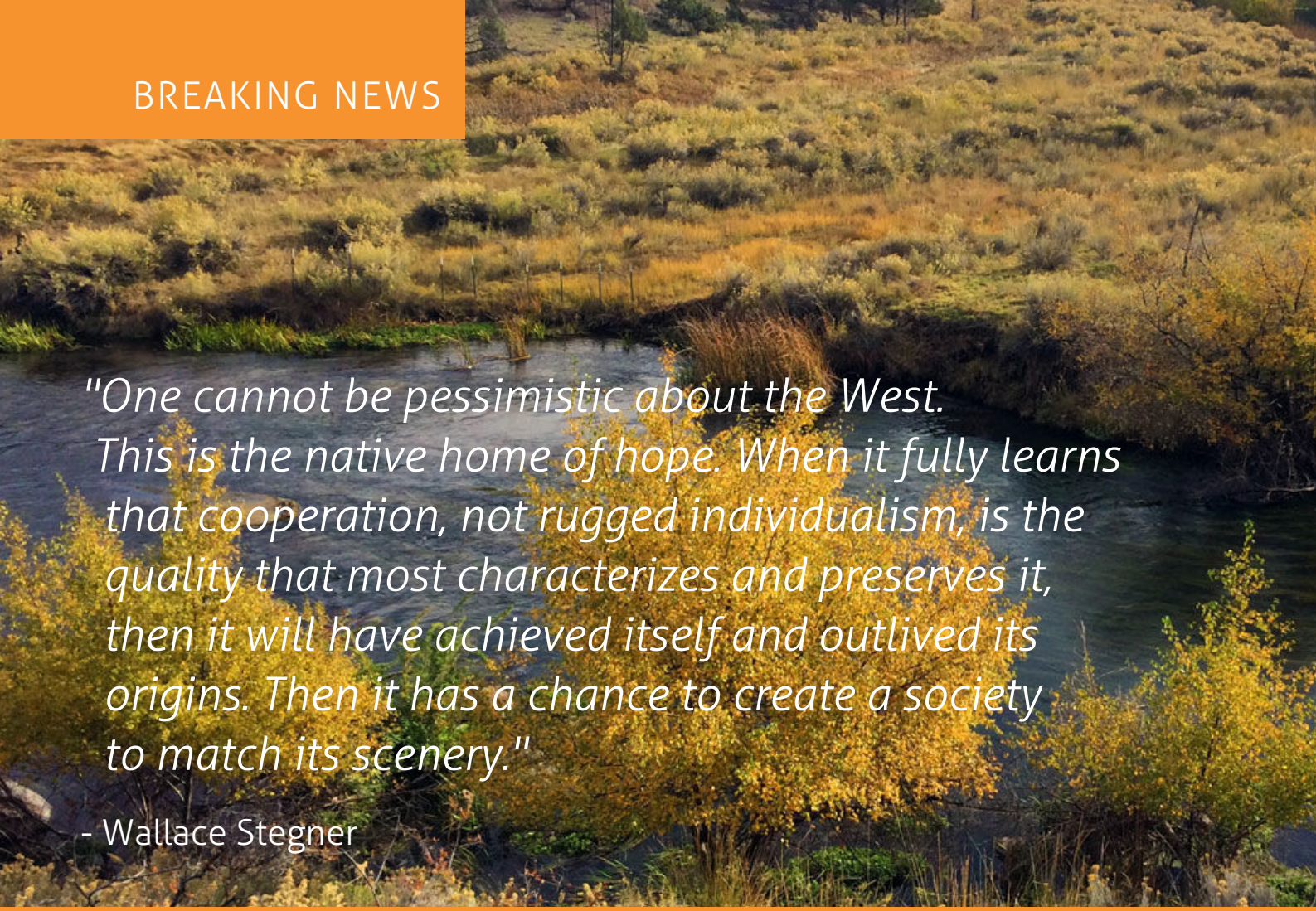
The following pages outline the SOS II report findings, its recom
implementing the key strategies with projects across the state.

Photo: Mike Wier

e worth fighting for, and CalTrout is leading the way.

mended Return to Resilience plan, and how CalTrout is already

BREAKING NEWS



"One cannot be pessimistic about the West. This is the native home of hope. When it fully learns that cooperation, not rugged individualism, is the quality that most characterizes and preserves it, then it will have achieved itself and outlived its origins. Then it has a chance to create a society to match its scenery."

- Wallace Stegner

The Findings

Patrick San
California T

California stands to lose 45% of its ren

A global loss of diversity?

In the State of the Salmonids II report we explore the following questions:

1. What is the status of all California salmonids, both individually and collectively?
2. What are major factors responsible for their present status, especially of declining species?
3. How can California's salmonids be saved from extinction?

At the current rate, California stands to lose 45% of its remaining native salmonids, including 11 of 21 anadromous species and 3 of 10 of its inland species, in the next 50 years unless significant actions are taken to stem the decline.

Under present conditions, 23 of the remaining 31 species (74%) are likely to be extinct in the next 100 years.

The Level of Concern is increasing for California's salmonids, but especially for its anadromous species. In general, anadromous species in California face a

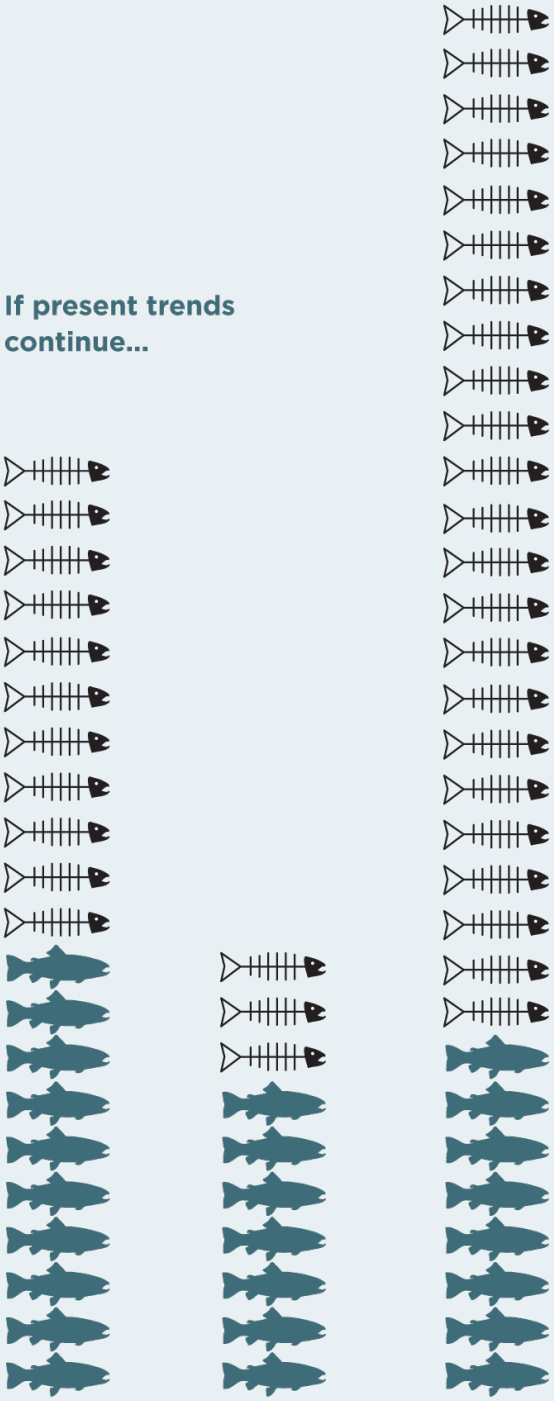
Photo: Val Atkinson

nuel, Conservation Program Coordinator,
Trout

naining native salmonids

higher risk of extirpation from their range than inland native trout because they depend on access to diverse, high quality habitat during various parts of their life cycle, and are therefore exposed to many anthropogenic and environmental threats throughout their lives. There are three main reasons for changes in the Level of Concern across nearly all salmonids since 2008.

1. the 2012-16 historic drought in CA,
2. improved information, and
3. increased understanding of climate change.



What is threatening our native fish?

Climate change. Climate change is the major, overarching anthropogenic threat affecting salmonids in California. It is considered a critical or high threat for 27 of 31 species (87%). It is considered a low threat to only one species, the Coastal rainbow trout. The majority of salmonid species in California is currently facing, or is likely to face, extinction from climate change if present trends continue.

What are the other human-caused threats to our native salmon, steelhead, and trout?

The population of California is approaching 40 million people. We live in a highly altered natural environment. As such, the human impact on the state's salmonids were important to include in the SOS II report because:

1. California's salmonids can adapt to natural environmental change, but that ability is limited when faced with these human-induced threats.
2. Human-caused threats limit the long-term viability of salmonid populations by decreasing their resilience to change.
3. Determining which threats have the greatest impact on species can help to target conservation and restoration efforts, providing a roadmap for a return to resilience.

The top three human-caused threats, after climate change, vary by anadromous and inland species as would be expected given their different life histories.

The top threats to anadromous species are overwhelmingly estuary alteration, major dams, and agriculture, while inland species face threats from alien species, fire, and hatcheries.

TOP 3 ANTHROPOGENIC THREATS TO ANADROMOUS SPECIES

ESTUARY ALTERATION

Estuary and lagoon habitat has been significantly reduced through conversion to support the state's growing population and myriad land uses. Loss of these productive rearing habitats statewide, but especially in the highly altered Sacramento-San Joaquin Delta, reduces survival for all salmonids.

CRITICAL/HIGH THREAT:
13 of 21 (62%)
anadromous species

MAJOR DAMS

Dozens of major and thousands of smaller dams block access to historical salmon and steelhead habitat. Dams also alter flow regimes by changing the timing, magnitude, duration, rate of change and frequency of historical streamflows.

CRITICAL/HIGH THREAT:
13 of 21 (62%)
anadromous species

AGRICULTURE

California's booming agricultural industry reduce the survival and productivity of all salmon runs in the state. Agricultural demands on water reduces and alter the timing of streamflows that degrade water quality and habitat.

CRITICAL/HIGH THREAT:
8 of 21 (38%)
anadromous species

TOP 3 ANTHROPOGENIC THREATS TO INLAND SPECIES

ALIEN SPECIES

Brown and Brook trout have been introduced extensively across California, and are sources of competition and predation for native trout. These non-native species are generally better able to survive in degraded habitats historically occupied by native species.

CRITICAL/HIGH THREAT:
7 of 10 (70%)
inland species

FIRE

Fires may potentially wipe out entire populations through direct mortality, sedimentation and siltation of habitat, and destruction of riparian habitat, especially for species with very limited ranges. Climate change is likely to increase the risk of more frequent and intense fires in California in the future.

CRITICAL/HIGH THREAT:
2 of 10 (20%)
inland species

HATCHERIES

Hatchery-origin Rainbow trout strains have been widely stocked across California for over a century. These fish hybridize with native Redband, Rainbow, Golden, and Cutthroat trout, and their offspring replace genetically pure populations in the limited habitats they still occupy.

CRITICAL/HIGH THREAT:
2 of 10 (20%)
inland species

The Action Plan

Return to Resilience: Saving Calif

Extinction

The science behind the SOS II report has made it clear: many of salmon, steelhead, and trout are in poor condition with the last several years of severe drought pushing several species to the edge of extinction.

Why should this be concerning to all Californians? Because resilient fish populations indicate healthy waters, important for drinking water, agriculture, commerce, and the health of people and the environments in which we live. Declining fish populations indicate degraded waters, which threaten the health and economic well-being of all Californians.

The good news is that 31 of our 32 kinds of salmonids still persist. We have an opportunity to reverse this trajectory toward extinction, but the findings of this report underscore that we must act now. We must take bold, scientifically informed, and innovative actions to improve resilience of our native salmon, steelhead, and trout and the waters upon which we all depend.

Rob Lusardi, CalTrout-UC Davis Wild and Coldwater Fish Scientist

ornia's Salmonids from

Improving salmonid status throughout California requires investing in productive and diverse habitats that promote salmonid diversity and resilience. From the findings of the SOS II report, California Trout has developed an action plan to return our rivers and salmon, steelhead, and trout to resilience. If fully implemented, many of the species in this report will thrive.

We call this plan a "Return to Resilience" recognizing that both salmonids and people must be resilient in reponse to change wrought by the ever-increasing human demands on the planet. The following pages outline some of the key strategies and highlight CalTrout projects that are already putting the plan to action and helping our imperiled native fish.

Strongholds: Protect

We must protect the best of what habitats are left. Few fully fu watersheds and high-quality habitat, exist today in California, s (pictured here) and Butte Creek, among others. This is reason e perpetuity the highest priority, to protect salmonid diversity an

PROJECT: Eel River Recovery

REGION: NORTH COAST

It was dubbed the "River of the Giants" by Field and Stream magazine in the 1930s and adulated by frenzied fisherman who flocked from San Francisco and all over the United States to do battle with its enormous and hard fighting steelhead and salmon. Memories of those legendary days from the early to mid-20th century have faded and been eclipsed by the current reality of a river struggling to regain a semblance of that famous past. Despite a long and precipitous decline that has resulted in native salmon and steelhead runs dwindling to a small fraction of historic numbers, the Eel River somewhat remarkably represents the best opportunity in California for recovery of a major salmon and steelhead fishery. CalTrout has a comprehensive recovery plan for the Eel and is hard at work bringing back this exceptional river ecosystem to its former abundance.

In spite of the damaging human impacts, the Eel has a unique set of factors working in its favor that make it a strong candidate for recovery. The first advantage is the Eel's location in a remote and sparsely populated area, with no major urban centers in its watershed. Thanks to its designation as a National Wild and Scenic River in 1981, no new dam Eel. There is no fish hatch be repopulated with its na its partners within the Eel golden opportunity and a broad set of actions to he make a comeback. There not only to repair the dama to bring back sustainab steelhead abundance.

In fact, there are already s the potential for a major re several years of Chinook larger numbers to the river Darren Mierau, the North C sees ample evidence of th have improved remarkably when population abundan he says. "I think we alre Chinook salmon run. And think there are tens of thou into the river based on the

Excerpt from the Winter 2016 issue

the Best

nctioning river ecosystems, with relatively intact uch as the Smith River, Blue Creek, the Eel River enough to make managing systems like these in d production.

ns will ever be built on the ery, and thus the river can tive wild fish. CalTrout and River Forum recognize this re actively implementing a lp the Eel and its wild fish is the potential on the Eel age humans have done, but le levels of salmon and

some encouraging signs of ecovery, most notably from salmon returning in much before the drought struck. Coast Director for CalTrout, he turnaround. "Conditions since the 1970s and 1980s, nce probably hit its nadir," eady have a fairly healthy some of the fishing guides usands of steelhead coming eir fishing success in recent

years. It's anecdotal evidence, but it aligns with observations of large numbers of fish from volunteers in the area who are counting fish."

To learn more about the Eel River Return to Abundance plan, watch the video above, read the Winter 2016 Current article or visit the Eel River Recovery webpage.

Photo by Mike Wier

"Conditions have improved remarkably since the 1970s and 1980s, when population abundance probably hit its nadir. I think we already have a fairly healthy Chinook salmon run. And some of the fishing guides think there are tens of thousands of steelhead coming into the river based on their fishing success in recent years. It's anecdotal evidence, but it aligns with observations of large numbers of fish from volunteers in the area who are counting fish."

- Darren Mierau, North Coast Director

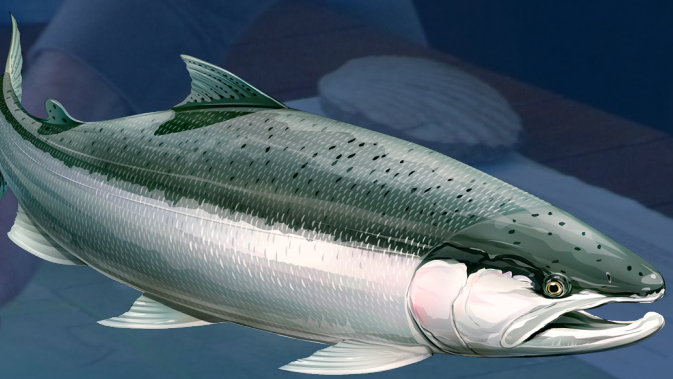
Which fish species benefit?

Historically, the Eel was the third largest salmon- and steelhead-producing river in California (exceeded only by the Sacramento and Klamath rivers). By extrapolating from cannery records from the late 1800s, fishery biologists estimate that in good spawning years over one million adult salmon and steelhead entered the Eel (comprised of approximately 800,000 Chinook salmon, 100,000 Coho salmon, and 150,000 steelhead).

Restoring the Eel River from headwaters to the sea will benefit all anadromous fish throughout their life cycles. Of particular importance is the Southern Oregon/Northern California Coast Coho, who are critically vulnerable to extinction as wild fish within the next 50-100 years. There has likely been a decline of 95% or more in numbers since the 1960s in California due to dam construction and habitat degradation from various land use practices.

The Eel is also home to coastal cutthroat trout and Northern California summer steelhead. All of the Eel's anadromous species benefit from restoration of the Eel River estuary, which provides important feeding opportunities and rearing habitat for juveniles before their journey to the

Excerpt from the SOS report



Northern California
Summer Steelhead
Oncorhynchus mykiss irideus
LEVEL OF CONCERN: CRITICAL

Southern Oregon/Northern
California Coast Coho Salmon
Oncorhynchus kisutch
LEVEL OF CONCERN: CRITICAL

Protect and Restore S

Protecting and restoring source waters including meadows, spr
will allow them to continue to provide refuges for salmonids d
buffer the effects of climate change. Source headwaters are ke
and are vital during periods of low streamflows and drought.

PROJECT: Sierra Meadows Partnership

REGION: SIERRA HEADWATERS

CalTrout's Sierra Meadows Program demonstrates that the restoration of degraded meadows improves water retention and replenishes summertime stream flows for inland trout. Healthy meadows also aide in reducing greenhouse gases.

Earlier this year, California Trout, with support from partners, National Fish & Wildlife Foundation and the CA Dept. of Fish & Wildlife, organized the third Sierra Meadows Workshop at Mayacamas Ranch in Calistoga, California. Over the three days, there were approximately 70 workshop attendees representing more than 20 different State and Federal, non-profit environmental, academic and private consulting agencies. The purpose of the workshop was to continue to build a broader meadows partnership with a focus on:

- how restoration affects greenhouse gas dynamics and the potential for developing a payment for ecosystem services market through Climate, Community, Biodiversity (CCB) credits and,
- implementation of the newly completed Sierra Meadow Strategy to increase the pace, scale, and efficacy of meadow restoration in the greater Sierra.

Discussions and presentations focused on updates on the research being done to

Source Waters

rings, and groundwater
uring stressful times and
y to hydrologic connectivity

quantify the potential carbon sequestration of restored meadow systems as well as a proposed road map towards CCB accreditation. The focus then shifted to actuating the actions and goals of the Sierra Meadows Strategy, a document recently completed by the Sierra Meadows Partnership to serve as guidance for practitioners, land-managers, funders and policy-makers.

Outcomes of the workshop include (1) an understanding of the status and findings of GHG quantification in Sierra meadows projects, (2) a "Roadmap" to developing Climate, Community, Biodiversity standards for accreditation, (3) renewed and formalized support for the Sierra Meadows Strategy, and (4) working groups and action plans to implement the Approaches in the Strategy to move toward the goal of 30,000 acres of meadows restored in the Sierra by 2030.

Click to learn more about CalTrout's Sierra Headwaters Keystone Initiative and the efforts to restore Sierra meadows. Click to view the workshop agenda and minutes. Click to view The Sierra Meadows Strategy V 1.0 report.

Photo by Tim Carl

Why are healthy meadows imp

"Everyone benefits from meadow restoration: flora and fauna, fisheries, and people. That is a fairly unique situation in the environmental restoration realm. Everyone should be able to get behind this work and move us from the current conversation centered on who wins and who loses from environmental stewardship to a recognition that we all can benefit."

- Mark Drew, Sierra Headwaters Director

Sierra Nevada headwaters provide roughly 60% of California's water supply, are home to the majority of California's inland native trout species, and are critical to supporting local and downstream economic livelihoods. However, Sierra Nevada headwater areas are also one of the most degraded regions throughout this vast landscape, threatening California's way of life. California's future and wellbeing depends on healthy headwaters, particularly given the uncertainty associated with a changing climate.

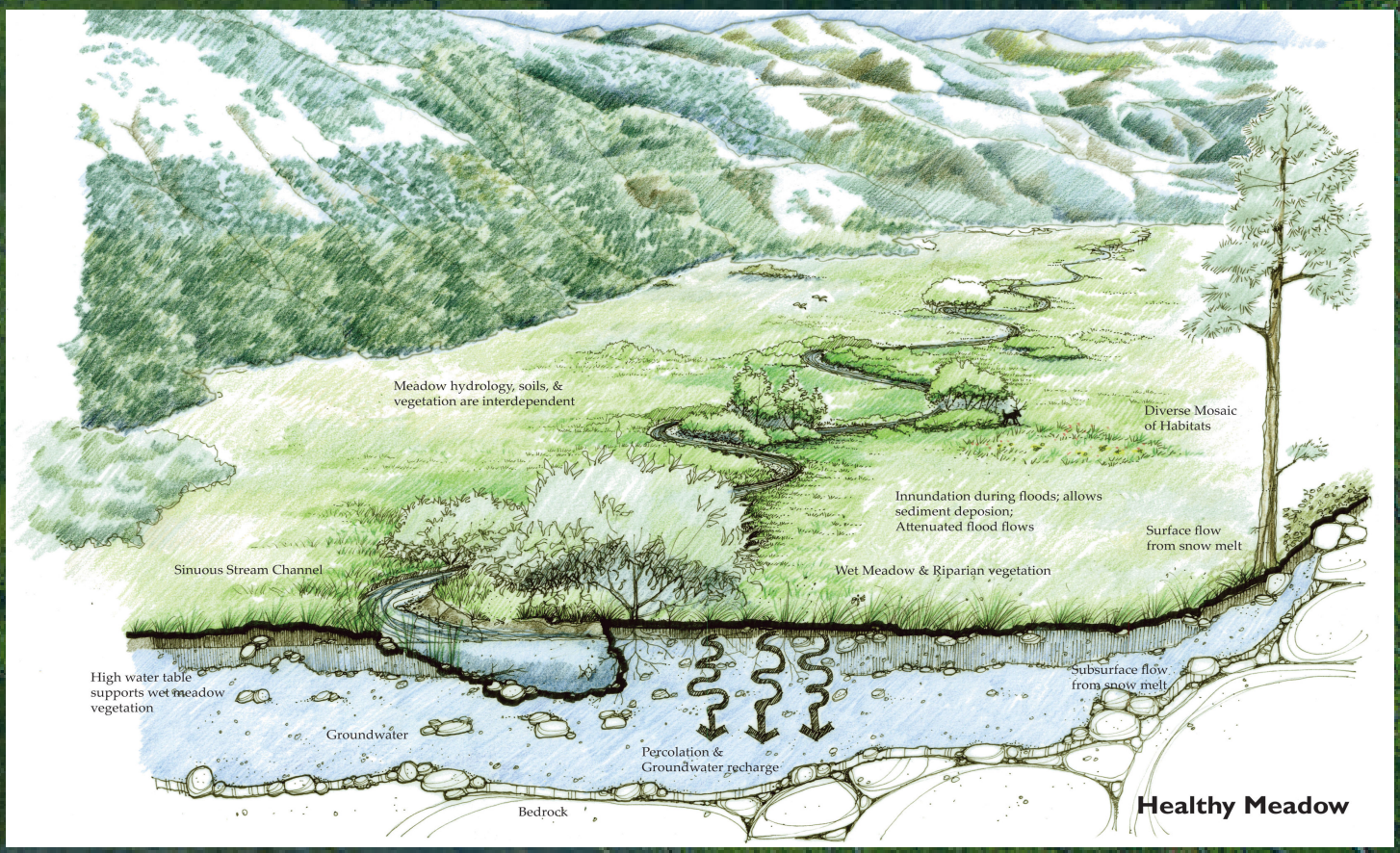
As Mark says, "Meadows are critical not only to the ecosystem, but they are also a key component of California's water infrastructure. Restoring meadows to their ecological health will in turn benefit California's water supply and quality for all."

In a degraded meadow, the hydrologic dynamics have been altered in a way that often lowers the water table and disconnects the stream from the meadow's flood plain. Over time, the meadow dries out leading to changes in vegetation, soil composition, and organic matter, as well as negative impacts to the aquatic environment critical to fish. The case for meadow restoration is fairly straightforward: by restoring the meadow you improve its ability to store, filter, and release water more gradually, and the improved hydrologic functioning of the meadow results in higher quality soil that is more efficient at storing carbon.

One of the primary goals of this work is to demonstrate that restored meadows are able to store more carbon than degraded meadows, and then convert this sequestered carbon into credits that can be traded on California's cap-and-trade market.

ortant?

Excerpt from the Summer 2015 issue



Click on image to enlarge

In the ideal scenario, the credits will be turned into funding to restore additional meadows, thus creating a self-sustaining cycle that would result in broader restoration of meadows across the Sierra and southern Cascades. The reality is that there are dozens of meadows that are considered prime candidates for restoration.

One way to frame the importance of this work is to consider its potential to help alleviate two of our state's most pressing environmental challenges: global warming and the drought. With projections of climate change showing that more Sierra precipitation will come in the form of rain rather than snow, the ability of meadows to store and release water efficiently will become even more critical to our state's water supply.

(To read the full article, click here)

Which fish species benefit?

Virtually all inland trout benefit from meadow restoration. Degraded meadows from grazing, drought, fires, logging, and climate change, to name a few, have taken their toll on California's native trout. Of the eleven remaining kinds of trout in California, five species saw an increase in Level of Concern since 2008.

Two species that are of critical concern, the Kern River Rainbow Trout and the California Golden Trout will certainly benefit from the meadow restoration being implemented in the Eastern Sierras by CalTrout and partners through the Sierra Meadows Program. The Little Kern Golden Trout (High Concern) will also directly benefit from meadows work, which restores the ability of meadows to hold cold snowmelt – like a living sponge – and slowly release it downstream over the hot summer months. In addition, meadow restoration can help stabilize streams and re-establish riparian vegetation, which provides shade and food for trout.

How are they threatened?

The majority of California's inland trout, including the Kern River rainbow, California golden, and Little Kern golden trout are all critically vulnerable to climate change impacts that will alter the snowmelt-fed streams they depend upon. While the highest portions of the southern Sierra Nevada may continue to retain a great deal of snow as temperatures warm throughout the rest of the state, snowpack may not persist as long into summers in the extensive meadows of the Kern Plateau. As a result, meadows are likely to become drier by the end of summer, which will reduce streamflows and available habitat for trout and increase temperatures of water that remains in streams.

Critical threats also exist from hybridization with other trout species, such as rainbow trout that were historically stocked throughout the Kern River drainage. Hybridization between Coastal rainbow trout and native trout species is a major threat to maintaining the genetic diversity of California's trout in their native range. While less severe recently, the long history of grazing livestock (mostly sheep) in the High Sierra has degraded meadow, riparian, and stream habitat. Some stream sections have been severely damaged, reducing the water storage capacity of meadows and total streamflows over time. By carefully managing this grazing and restoring degraded habitats, we can greatly improve the suitable habitat for California's native trout.

Excerpt
from the
SOS report

Kern River Rainbow Trout
Oncorhynchus kisutch
LEVEL OF CONCERN: CRITICAL

California Golden Trout
Oncorhynchus kisutch
LEVEL OF CONCERN: CRITICAL

Restore Productive a

Restoring function to once-productive but now highly altered habitats, especially floodplains, coastal lagoons, estuaries, and spring-fed rivers, can greatly improve rearing conditions for juvenile salmonids. These types of habitats are relatively scarce, yet are vital nurseries for juvenile fishes and support robust growth rates when compared with typical in-river conditions. Improved growth prior to ocean migration and high life history diversity increases the likelihood of marine survival and adult returns to natal tributaries.

Excerpt from the Spring 2015 issue

PROJECT: Wild fish in working landsc

REGION: CENTRAL CALIFORNIA

Human alteration of Earth's natural systems has been so pervasive that we are now in a new era, the Anthropocene, in which human actions have become the main driver of global environmental change. As the global human footprint expands, the area available to wild species is shrinking. With roughly 38% of the non-ice terrestrial surface of the planet dedicated to crop and pasture lands, agriculture is the dominant human land use. Accordingly, agriculture is a major driver of terrestrial habitat loss, degradation of aquatic ecosystems, and greenhouse gas emissions. Habitat loss, in turn, is the root cause of the current global extinction crisis where the earth is losing species faster than anytime in the last 65 million years. Some scientists predict extinction of 30-50% of the species on the planet in the next 50 years. Increasing the benefit to native species provided by working agricultural lands, therefore, represents one of conservation's biggest challenges and greatest opportunities. CalTrout's "Nigiri Project" is demonstrating how this type of ecological reconciliation on farmlands can be accomplished. The project (named for a form of sushi with a

nd Diverse Habitats

apes – The Nigiri Project

slice of fish atop a wedge of rice) is a collaborative effort between farmers and researchers to help restore salmon populations by reintroducing young salmon onto winter-flooded rice fields.

Working with landowner Knaggs Ranch, the UC Davis Center for Watershed Sciences, and the California Department of Water Resources, the experiment has shown that off-season agricultural fields can provide critical floodplain habitat for endangered fish. These "surrogate wetlands" mimic the floodplain rearing habitat used by young salmon, which has been largely eliminated by the development of the Central Valley for farms and houses. The purpose of the project is to test the hypothesis that, through better planning and engineering, farm fields that produce agricultural crops in summer can also produce food and habitat for fish and wildlife during winter when crops are not grown. (Click to read the full article. To visit the Nigiri Project web page click here.)

Photo by Mike Wier

Which fish species benefit?

While all salmonids traveling through the Golden Gate and into the Delta will benefit from the Nigiri Project and other floodplain projects (Central Valley spring-run, fall-run, and late fall-run Chinook; and Central Valley steelhead) the Sacramento River winter-run Chinook salmon (winter-run) face immediate risk of extinction. The Evolutionary Significant Unit has been extirpated from its native spawning range by dams and has been reduced to a single small spawning population, which is wholly dependent on artificially-created spawning habitat and cold water releases from Shasta Reservoir.

Sacramento River Winter-Run Chinook Salmon

Oncorhynchus tshawytscha

LEVEL OF CONCERN: CRITICAL

How are they threatened?

Multiple critically dry years (2012-2016) in a row during the drought put winter-run on the edge. Unlike other Central Valley runs, their eggs incubate in early summer and hatch out during the hottest time of year. Historically, this worked in the cold spring-fed waters of the McCloud River, where the winter-run, a unique run of salmon not found anywhere else, spawned before construction of Shasta Dam. Now, they are relegated to the area below Keswick Dam near Redding and get hit hard when the cold-water pool in Shasta Reservoir runs out. The building of Shasta Dam put this species on the edge of extinction—they were the first California salmon to be listed as an Endangered Species in 1994. Species on the edge don't have the resiliency to withstand out-of-ordinary conditions.

Improve Connectivity

Removing dams and fish passage barriers or providing volitional pass
habitats is key for persistence of many anadromous salmonids. Acces
abundance, improve life history diversity, and population resilience t
downstream of dams, there is a need to institute scientifically based e
California that favor native species.

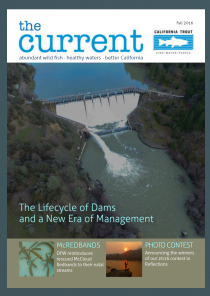
PROJECTS: Klamath, Potter Valley, Ma

REGIONS: MT. SHASTA/KLAMATH, NORTH COAST, AND SOUTHERN CALIF

Rivers play a major role in shaping California's landscape and how people use that land. Over the past century, more than a thousand dams have blocked, slowed, or redirected California's rivers.

The SOS II report finds that major dams are a top threat to our anadromous, or migratory, species with 13 of 21 having dams as a critical or high threat. Our scientific understanding of river ecosystems has advanced tremendously since most of those dams were built, and it's now clear that dams have had tremendous adverse impacts on fish species communities and river ecosystems. While some dams continue to work effectively, others have outlived their usefulness. In reality, many dams warrant either a major overhaul or outright removal.

Excerpt from the Fall 2016 issue



y and Fish Passage

age to historically important spawning and rearing
s to lost habitats will help boost population
o environmental changes. For populations
environmental streamflow regimes throughout

tilija Dams, Trabuco Fish Passage

ORNIA

Photo by Mike Wier

California Trout is dedicated to supporting healthy river ecosystems in the interest of promoting resilient wild fish populations while also meeting the needs of people. One of the best opportunities for influencing the management of rivers is the Federal Energy Regulatory Commission (FERC) relicensing process. Every hydroelectric dam must apply for a new FERC license to continue operations every 30 to 50 years. CalTrout is currently engaged in that process for several major dams.

CalTrout applies the best available science to help evaluate the current costs and benefits of dams that are up for relicensing, and offer suggestions for opportunities to improve fisheries and water management. Addressing shortcomings in existing dams usually means improving fish passage and adjusting the management of flows. When appropriate, CalTrout advocates for dam removal.

The Klamath River: Deadbeat dams to be removed

The Klamath River was once renowned among anglers for its steelhead. And since time immemorial, native tribes have depended on its abundant salmon and other native fish.

Iron Gate (Klamath), Dwinnell (Shasta), and Lewiston (Trinity) dams block access to a majority (970 km or about 600 mi) of historical spawning habitat for spring-run Chinook.

Recovery of salmonid populations will be significantly aided by removing four dams on the Klamath River (Iron Gate, Copco 1, Copco 2, and JC Boyle) and opening up fish passage to over 400 miles of potential spawning and rearing habitat. Slated to take place in 2020, the dam removal will amount to one of the largest river restoration efforts in the nation.

The Potter Valley Project: Letting science guide the way

The Eel River, which originates in Lake and Mendocino counties and flows through Humboldt County to the ocean, supports spawning populations of fall run Chinook salmon, summer and winter run steelhead, and coho salmon.

CalTrout has been studying the potential spawning and rearing habitat above Lake Pillsbury should salmon and steelhead be provided access to the waters above Scott Dam.

We have been playing an active role during the comment phase of the relicensing period by providing scientific data about stream flows and fish passage. Our goal is to help advise whether PG&E should consider any alterations to how they operate their dams, taking into account the needs of fish, irrigation uses, and hydropower generation.

Which fish species benefit?

Recent returns of Upper Klamath-Trinity rivers (UKTR) spring-run Chinook salmon to the South Fork Trinity and Salmon rivers represent a small fraction (< 3%) of historical numbers. Drought from 2012-2016 significantly reduced cold water during critical over-summering periods for spring-run Chinook, contributing to their decline. Removal of the four Klamath dams will give UKTR Spring-run Chinook access to critical spawning and rearing habitat.

Upper Klamath-Trinity Rivers Spring-Run Chinook Salmon

Oncorhynchus tshawytscha

LEVEL OF CONCERN: CRITICAL

Southern Oregon/Northern California Coast Coho are critically vulnerable to extinction as wild fish within the next 50-100 years. There has likely been 95% or more decline in numbers since the 1960s in California due to dam construction and habitat degradation from various land use practices.

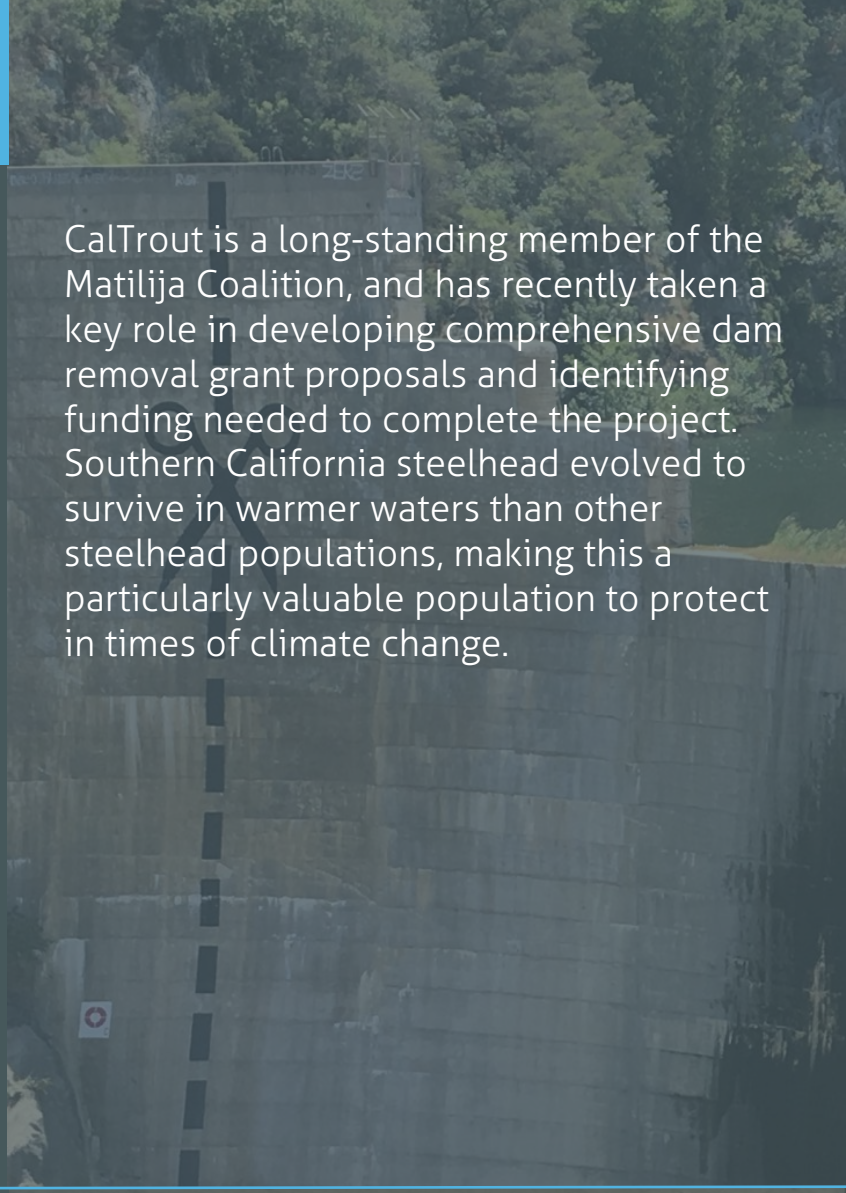
Southern Oregon/Northern California Coast Coho Salmon

Oncorhynchus kisutch

LEVEL OF CONCERN: CRITICAL

Matilija Dam: How to pull the plug?

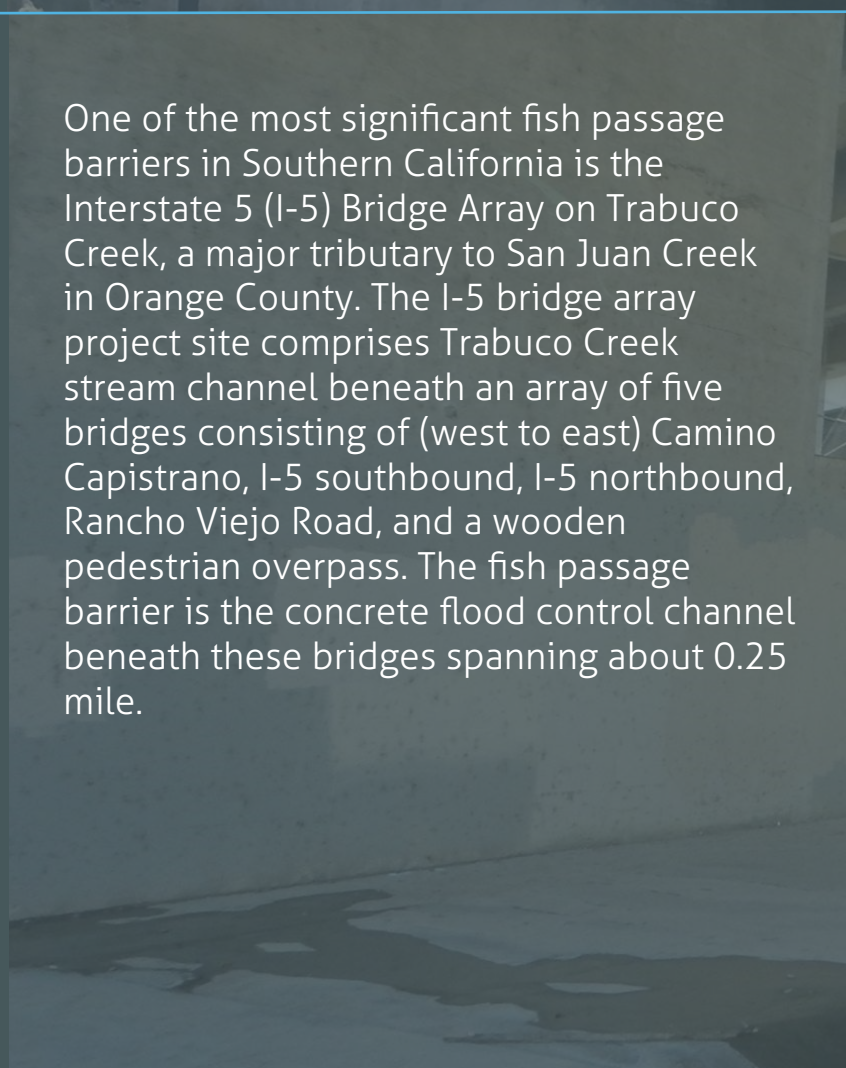
The case of Matilija Dam in Ventura County illustrates the complexities of dam removal. Built in the 1940s for flood control and irrigation water storage, it was condemned by the 1960s as being structurally unsound.



CalTrout is a long-standing member of the Matilija Coalition, and has recently taken a key role in developing comprehensive dam removal grant proposals and identifying funding needed to complete the project. Southern California steelhead evolved to survive in warmer waters than other steelhead populations, making this a particularly valuable population to protect in times of climate change.

Trabuco Creek: Making way for steelhead

Providing fish passage on Trabuco Creek in Orange County at Interstate 5 crossing will address one of the most significant barriers in Southern California. A redesign will reconnect fragmented habitat.



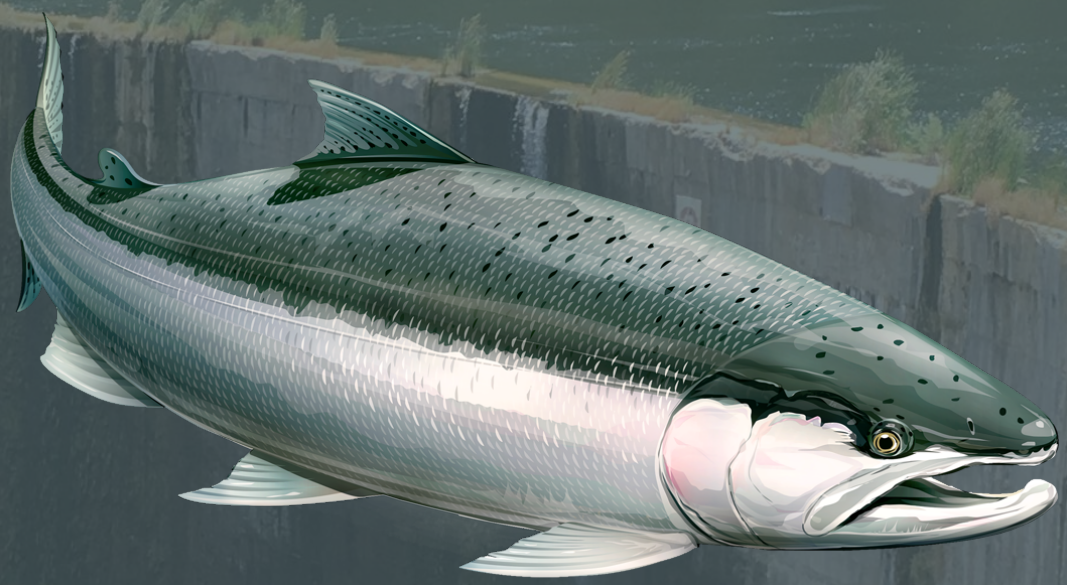
One of the most significant fish passage barriers in Southern California is the Interstate 5 (I-5) Bridge Array on Trabuco Creek, a major tributary to San Juan Creek in Orange County. The I-5 bridge array project site comprises Trabuco Creek stream channel beneath an array of five bridges consisting of (west to east) Camino Capistrano, I-5 southbound, I-5 northbound, Rancho Viejo Road, and a wooden pedestrian overpass. The fish passage barrier is the concrete flood control channel beneath these bridges spanning about 0.25 mile.

Which fish species benefit?

Southern Steelhead

Oncorhynchus mykiss irideus

LEVEL OF CONCERN: CRITICAL



Southern California steelhead are extremely endangered, with only an estimated 500 individuals remaining. Opening up access to spawning and rearing habitat above Matilija Dam will expand critical steelhead habitat to help bolster population numbers in the watershed and region.

In addition, providing fish passage at the Trabuco Creek/I-5 intersection has among the greatest potential in the region to contribute to recovery of the endangered Southern California steelhead. Once the fragmented habitats are reconnected, the impacts are unlikely to reoccur and will leverage upstream fish passage barrier removal in the public lands of the Cleveland National Forest.

These are just two of the fish passage projects being implemented in our Southern California Region. Click to learn more about the Santa Clara River Steelhead Coaltion and South Coast Steelhead Coalition work.

Together, we can take action to ensure Ca
wild trout, steelhead, and salmon.

Your gift today will make a difference. It is the single most effective th
again in California's streams and rivers. Thank you for your support.

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Your donation will make a differe

lifornia has thriving populations of

ing you can do to help salmon and steelhead thrive once

SOS Response Effort

ence to fish, water, and people.

Receive this beautiful poster!

Donate at the $100 level to CalTrout's SOS Response Effort and receive a poster with artwork by Paul Waters.

PARTNER PROFILE

Scott River Water Trust

Preston Harris, Executive Director

Preston Harris lives in Scott Valley, California, with his wife and three daughters. He is a natural resource consultant specializing in flow improvement and in-stream enhancement.

The Scott River Water Trust is the first active water trust in California and is a community-supported organization that operates with the cooperation of local farmers, ranchers, agencies, and businesses. Their purpose is to improve stream flow in priority fish habitat reaches of the Scott River and its tributaries through voluntary water leases with agricultural producers.

To help improve the survival and growth of young coho salmon and steelhead, they focus on leasing water during the irrigation season in the late summer months, primarily in the cooler, west-side tributaries. In the fall, when surface diversion is used to water livestock, the Trust focuses on obtaining leases to increase mainstem Scott River flows, which assists with passage for spawning Chinook salmon, coho salmon, and steelhead trout.

THE MUDDY WATERS of the Scott River enter the Klamath River. The Scott River has one of the last best runs of wild coho salmon, and is one of the primary producers of coho in both California and Oregon. The Scott River is thus critical to the long-term survival of this threatened species

Photo: Daniel Nylen

PARTNER PROFILE

It's no secret that the Klamath River Watershed is a basin riddled with conflict. From fish population protection to irrigation water delivery, the decades-old battles that span two states, multiple indigenous territories and thousands of agricultural acres continue to simmer, and at times boil over. I don't think any natural resource professional working in the basin can say with a straight face that these cultural, economic and philosophical issues have an end in site. If you ask someone what the key to restoring the Klamath is, chances are you would hear about irrigation reduction, or increased fishing regulations, or dam removal. Every pro could be followed by a con, and the seemingly endless struggle to restore one of the West's most important watersheds slowly moves forward, like a slug of sediment creeping down the river. It's a difficult thing to witness and be involved in, but though the Klamath seems to be perpetually shrouded in conflict, there are a lot of positive efforts taking place throughout this diverse watershed that tend to get absorbed by the basin's more polarizing topics.

One such area is the Scott River Basin, which is a 58-mile long tributary that rests in between the Shasta River to the east and the Salmon River to the west. Like other watersheds in Siskiyou County, the Scott Basin's economy primarily consists of logging and agricultural production, with the former being largely suppressed. However, farming and ranching is another story. This industry is economically stable, if not thriving from time to time, but that doesn't mean this local industry is free of conflict. The Scott is a

Photo: Preston Harris

bubble within a bubble, meaning it's a microcosm of the greater Klamath River. If you're searching for an area where natural resource issues are as hot as a branding iron, well, you've come to the right place.

Surrounded by the Marble Mountains, Russian Mountains, and Trinity Alps to the west, and the Mineral Range and low lying hills to the east, the Scott is truly a majestic landscape. As the river travels south from it's southern headwaters, it runs through the 33,000-acre Scott River Valley, which is home to dozens of family-based alfalfa farms and cattle ranches. High mountain tributaries almost systematically feed the river as it flows through the countryside. Upon clearing the valley, the Scott enters an approximate 20-mile long canyon before flowing into the Klamath River.

So, where does the conflict lay? As mentioned there's plenty to choose from, but perhaps the most pressing issue facing the watershed revolves around coho salmon. This species is state and federally listed as threatened in California, and the Scott is home to the largest population of coho in the Klamath Basin and state. Coho salmon's life history strategy includes juvenile summer rearing before migrating to the ocean the following spring. Often times, as summer moves into fall, water availability diminishes which reduces rearing habitat for coho. And therein lies much of the problem, limited water for fish versus the need for irrigation delivery—a widespread theme across the West.

Despite this, the Scott Basin has some good things going for it (like improving coho runs and a viable farming economy) but what it could use is support from outside groups to help highlight and advance all the good work coming from the natural resource and farming communities.

Enter, California Trout.

One day in February of 2015, I received a call from CalTrout's Shasta/Klamath Regional Director, Andrew Braugh. He said that his organization was interested in working in the Scott and that he would like to schedule time to discuss the possibility of our respective organizations collaborating on projects. In all honesty, my first reaction was one of caution. CalTrout was on the other side of some politicized topics in the Klamath, and partnering with them could prompt backlash. However, instead of telling Andrew no I decided to hear him out. My limited understanding of CalTrout was that they were not nefarious or malicious with the positions they took; it was more that they believed in their organizational mission, which had not always aligned with others working and living in the Klamath Basin. Likewise, Andrew heard me out and was understanding of the sensitivities surrounding

Photo: Patrick Jarrett

the Scott River. He said that CalTrout's motto is Fish, Water, People, and that their intent was to advance restoration and help assist with resource related issues for the betterment of communities and their stream systems. After numerous conversations I felt comfortable collaborating on a project, and we set our sites on a quarter mile restoration project along the South Fork Scott River. The process of conceptualizing the project and obtaining funds went pretty smooth, so we tried something similar for an off-channel rearing pond at a different location. That went smooth, too, so we upped the stakes and dove into the more complicated task of working with water users to enhance in-stream flow in high priority rearing locations. Though we don't have a finished product, we're getting close to finalizing deals that will be a win-win for farmers and fish.

And we haven't stopped there.

(continued on page 62)

DONOR PROFILE

Andy Grubbs

CalTrout Stronghold Circle Member since 2016

I was a camp counselor in the Yosemite area for two years. Kids would come in from all over the country and for two weeks they would play and explore the surrounding wilderness. My job was to do the exact same thing–albeit, more responsibly.

Part of my job was to take the kids on a three day backpacking trip high up into the Ansel Adams Wilderness or the Yosemite backcountry. Day two of the trip always ended with me casting to rising little trout that had been planted in these high alpine lakes years ago. The kids would be watching from a rock and if a fish took my fly I would hear something along the lines of "THE FISH TOOK IT!" Once the fish was in we would unhook it and watch as this small, fragile creature swam back into the lake. I would always try to use this as an opportunity to communicate how special these fish are, and how the places that hold them are just as important and need our protection and help.

So why do I give to CalTrout? Well, I believe in the work that they are doing. I believe that CalTrout helps protect the places that we love to play in and share–rivers, lakes, and their surrounding areas. Similarly, and of equal importance, is that CalTrout values the people that rely on these places not only for recreation, but also for livelihood. They work to find sustainable and long-term solutions that make it possible for both groups' wants and needs to be met. In turn, we each can share our passions and livelihood with generations to come. That is why I give to CalTrout."

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Fish and Flows

By Mikey Wier

California can truly be a land of extremes. From extreme drought to heavy flooding in just two years. What a wild ride it has been. After suffering through five of the driest years of my lifetime now we are having one of the wettest winters I can remember. A series of atmospheric rivers pounded California throughout the winter months. Mammoth claimed the most snow they have ever received in the month of January. The Eel River in Northern California peaked at 230k csf, **the 12th largest river level in recorded history**. The Lower Sacramento River had been flowing at over 90k csf, the biggest it's been in 20 years. Every river in Northern California has been flowing at levels we have not seen since the New Year's flood of 1997. Large reservoirs like Folsom, Melones, and Oroville that were down below 20% capacity two summers ago are now up to 90% or 100%. As the outreach coordinator for California Trout and a fly-fishing ambassador for Patagonia, I often get asked: "How is all this water affecting the fishing?" Well, the simple answer is; It's great for the fish, not so great for fishing in the short term but it certainly will be in the long run.

There is a simple rule that applies to most situations: more water = more fish. Now this is not always the case but as a general rule it will apply to native salmon, steelhead, and trout.

Photo: Phil Reedy

As far as fishing goes, it's very hard to target and catch fish during high water events but for the native fish's sake, they are actually great. Let's talk about a few of the ways high water events are good for native salmonids in California.

Access

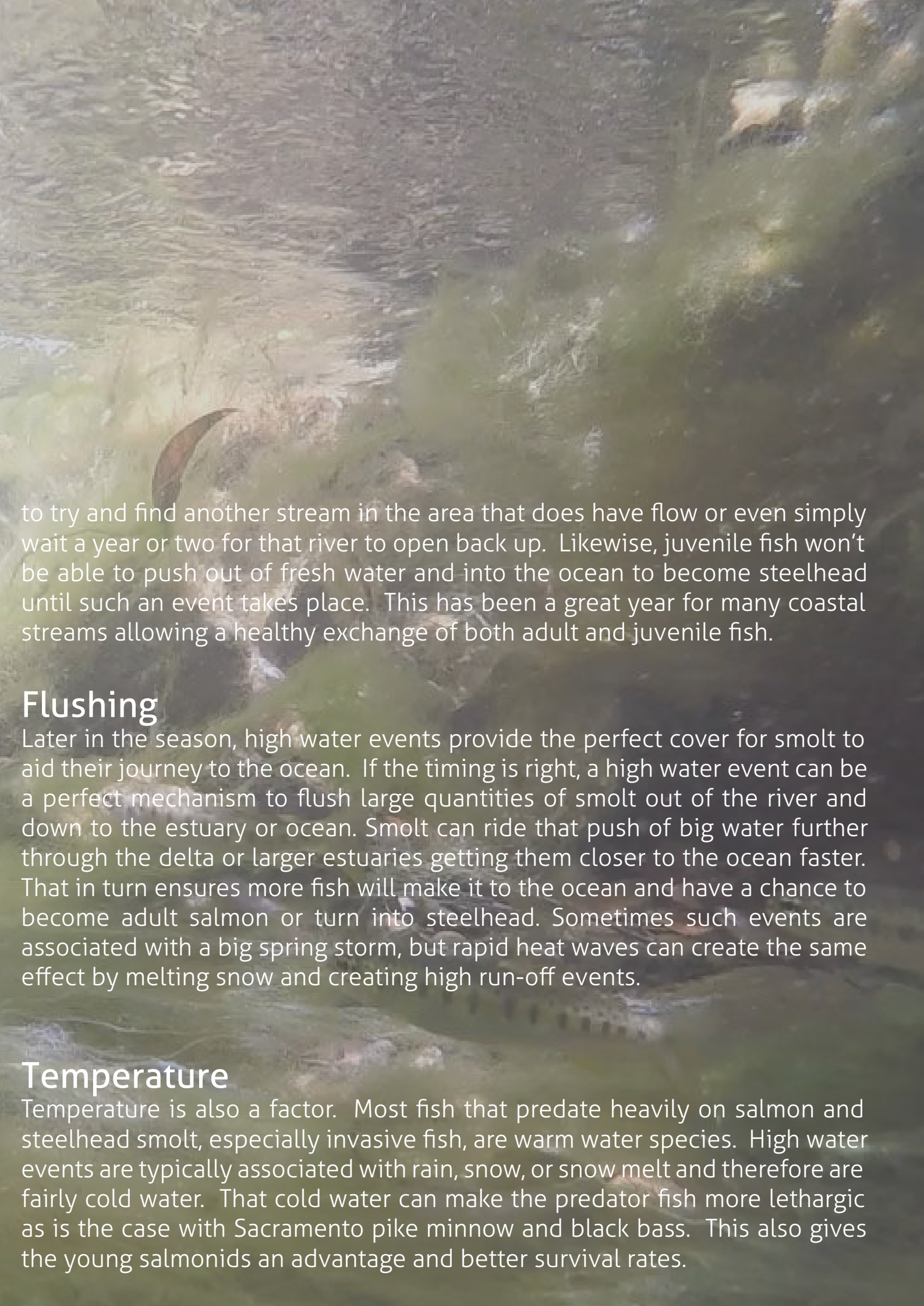
One of the main benefits to high water events is that they provide access to more habitat. When we have large amounts of rain, fish like salmon and steelhead that are known for traveling large distances to spawn have access to an increased amount of habitat. Extreme high water events allow fish to pass over obstacles that would otherwise be impassable at lower water levels like small water falls, cascades and even some dams and weirs. Have you ever watched a salmon or trout trying to jump a small water fall? Then have you ever seen that same river at flood stages? Chances are that little water fall is no longer a water fall and more of a bump under a mass of water. And while floods look super turbid to us, there's always a soft pocket of hydrology somewhere that fish can take advantage of. Salmon and steelhead are highly adapted and opportunistic and they use such events to pass obstacles and reach habitat that may have been cut off for many years previous.

Tributaries

On the same token, many small creeks and streams that may not flow all year long, or may not have had flow for several years, are now open to fish passage. I've heard several people saying they have seen steelhead and salmon spawning in creeks they have not seen them in for many years or even in places where people have never seen them at all. Salmon and steelhead are very opportunistic in nature and will take full advantage of habitats that come available only in high water events. In fact that is one of their evolutionary life strategies. If it's a low water year, they have the ability to spawn main stem in rivers such as the Eel, Klamath, or Smith but when water allows, they would much rather push higher up in to the headwaters where water is likely to stay cold longer, there may be more insect life for juveniles to feed off, and there will potentially be less predation by other fishes that can tolerate warmer water temps such as Sacramento pike minnow, perch, bass, and catfish.

Estuary Breach

In smaller river systems like those of Central and Southern California, often it takes a high water event to breech the sand bars that form during low water periods and cut off fish passage between the fresh water system and the ocean. Many of the small coastal rivers terminate in a lagoon. These lagoons or estuaries act as nurseries for juvenile fish. Some streams might get a few years or even longer before a good high water event flushes enough fresh water down a river to inundate the estuary and eventually push the sand out of the way and create an opening to flush to the ocean. In Southern California adult steelhead will often return to the stream of their birth only to find they can't access it due to no flow connecting it to the ocean. They then have the option



to try and find another stream in the area that does have flow or even simply wait a year or two for that river to open back up. Likewise, juvenile fish won't be able to push out of fresh water and into the ocean to become steelhead until such an event takes place. This has been a great year for many coastal streams allowing a healthy exchange of both adult and juvenile fish.

Flushing

Later in the season, high water events provide the perfect cover for smolt to aid their journey to the ocean. If the timing is right, a high water event can be a perfect mechanism to flush large quantities of smolt out of the river and down to the estuary or ocean. Smolt can ride that push of big water further through the delta or larger estuaries getting them closer to the ocean faster. That in turn ensures more fish will make it to the ocean and have a chance to become adult salmon or turn into steelhead. Sometimes such events are associated with a big spring storm, but rapid heat waves can create the same effect by melting snow and creating high run-off events.

Temperature

Temperature is also a factor. Most fish that predate heavily on salmon and steelhead smolt, especially invasive fish, are warm water species. High water events are typically associated with rain, snow, or snow melt and therefore are fairly cold water. That cold water can make the predator fish more lethargic as is the case with Sacramento pike minnow and black bass. This also gives the young salmonids an advantage and better survival rates.

Craig's Corner

by Craig Ballenger, CalTrout Ambassador

Weather Extremes in California

With near record snowfall this past winter, we pulled into Mammoth a couple months ago to a pure winter blizzard. I could barely see the stoplight. Even hardy Mammoth mountain folks repeatedly shared with me how sick they were of snow.

With the historic pendulum of California weather for the moment turned the other way, the state's rivers are in fabulous condition. Though Hot Creek was the only eastern Sierra stream fishable due to high water at the time, great angling has finally arrived.

Far away, up in the northwest corner of the state, many of our steelhead rivers rarely or barely came into fishing condition during the season. Yet this is a source of encouragement for future seasons, as spawning tributaries were opened up to returning fish which had been completely inaccessible during the drought.

Rivers and streams in the coastal region will always remain vulnerable, though projects to provide restoration on three of the regions iconic streams are ongoing and underway. Even further north from the Eel, Trinity and Klamath, rolls California's gem steelhead and salmon river, the Smith. Congressman Huffman's work has already contributed protection from a proposed nickle mine on the Smith River's North Fork and he gives us an overview in this installment of Craig's Corner.

If there was ever a season to get out and explore the grand diversity of rivers and streams across the state, this is it. For angling and outdoor aficionados, maps are unfolding and plans being laid.

MIKE WIER, Eel River, Humboldt County, CA "*Spawni*

REFLECTIONS

ng Coho"

TYLER GRAFF, San Francisco, CA


20"

TYLER GRAFF, San Francisco, CA

BRIAN DUFOUR, Lakeport, CA

CALTROUT VIDEO VAULT

INSPIRATION

CalTrout works to ensure there will always be resilient wild fish thriving in healthy waters for a better California. This video is what inspires that mission.

ENOUGH IS ENOUGH

Enough is Enough follows three anglers as they tell the story of the fabled McCloud River in Northern California.

SURFING THE WEB

CONVERGENCE

By Conservation Hawks - If you love to fish, and if you care about wild places and healthy landscapes, then CONVERGENCE is an absolute must-see.

THE RIVER - A DEEP ECOLOGY VISUAL POEM

By Last Leaves - This short film is a compilation of work from a few different sources including a book called Endgame by Derrick Jensen

Who We Are

IN THE SPOTLIGHT

TRACEY DIAZ, MarCom Director

Tracey brings to CalTrout a broad range of marketing knowledge and that good old Midwestern can-do attitude. With a degree in advertising from the University of Michigan, she spent 20 years in the ad and media sales world before shifting to work in the environmental nonprofit sector. Tracey lives in Marin, California with her husband and three children and in her 'spare' time enjoys woodworking, mountain biking and reading.

Photo: Tim Huckaby

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Scott River Water Trust *con't from page 36*

For the past eight months we have been collaborating with a working group that consists of the area's most qualified individuals to bring habitat restoration and enhancement efforts to nearly three contiguous miles of the mainstem Scott River. It's a project that has enormous fisheries potential, and is a great opportunity for restorationists working in the Scott Basin to take our efforts and partnerships to the next level. It's also something that would not be possible without the cooperative effort started by Andrew and myself.

CalTrout has displayed fairness and honesty and the opportunities originating from our willingness to work together will only benefit the watershed. If people sit down and talk about their positions and why they take the stances they do, chances are some common ground will be found. I know that sounds rudimentary but communication doesn't always happen. Andrew and I took the time to listen and be open-minded, and I think fish, water and people in the Scott will be better for it.

Fish and Flows contintued from page 47

Scouring:
High water events are also good in that they clean rivers out. Many rivers build up different types of algae during the warm summer months, especially tail water fisheries that have fairly stable flows controlled by dams. In the past several years, evasive didymo slime has become a real problem for many of California's rivers. Didymo and other types of algae can completely take over the sub-straight and choke out a vast majority of insect life as well as deplete oxygen levels which will bring water temperatures up. A good high water event is needed to break up and flush out
pebbles are much better
Salmonids also require cle
water events also clean o
sticks that may have built

Sediment Transport:
Sediment transport is an
hydrology. High water eve
rocks and dirt moving. So
scour pools out and create
to fish for holding habitat.
the other way and deep p
sediment making them sh
though, high flows are go
around and flushing sedim

Habitat Complexity:
High water events can a
complexity in streams and
wood is one of the absolu
habitat. It's provides cover
promotes macro invertebr
fall into or near rivers. High
to either push the wood o
so fish can maintain passa
into the stream channel cre
that has fallen during the s
flows to scour out around
and holding areas for fish u
This habitat is critical for
steelhead as well as smolt

Floodplains:
According to studies condu
Davis, floodplains are som
areas for juvenile fish rear

t algae. Clean rocks and for macro invertebrates. an gravel to spawn. High ut debris like leaves and up over the dry season.

important part of stream nts are needed to get the ometimes high flows can depth which is preferable . Other times it can work ools may be filled in with allow. For the most part ood for moving the river ment.

lso be good for habitat rivers. Surprising to some, te best materials for fish r from predators and also rate growth. Often, trees h water events are needed ut of the stream channel age or to pull new wood eating new habitat. Wood summer often needs high d it, which creates pools under logs and root wads. r both adult salmon and ts.

ucted by CalTrout and UC ne of the most productive ring habitat. When the water spreads out, it slows down and the young fish don't have to work so hard to fight the currents. There's also much greater access to food on the floodplains. The shallow water acts as a lens allowing light to penetrate more off the bottom which promotes faster and more growth of organisms that provide food for fish. Also, as the water rises it inundates lots of land dwelling insets which also become food for fish. Smolts often only have access to floodplains during extreme high water events. Almost every river in California used to have a floodplain. Now, many lower river areas have been levied off to protect bottom lands for agriculture and other development. Extreme high water events allow fish to access flood plain areas that are otherwise inaccessible at normal flows.

In conclusion, high water events are a part of the natural system our native fish have adapted to use. They are a necessary part of the ecosystem in California and incredibly beneficial to native fish, especially salmon and steelhead.

Mike Wier

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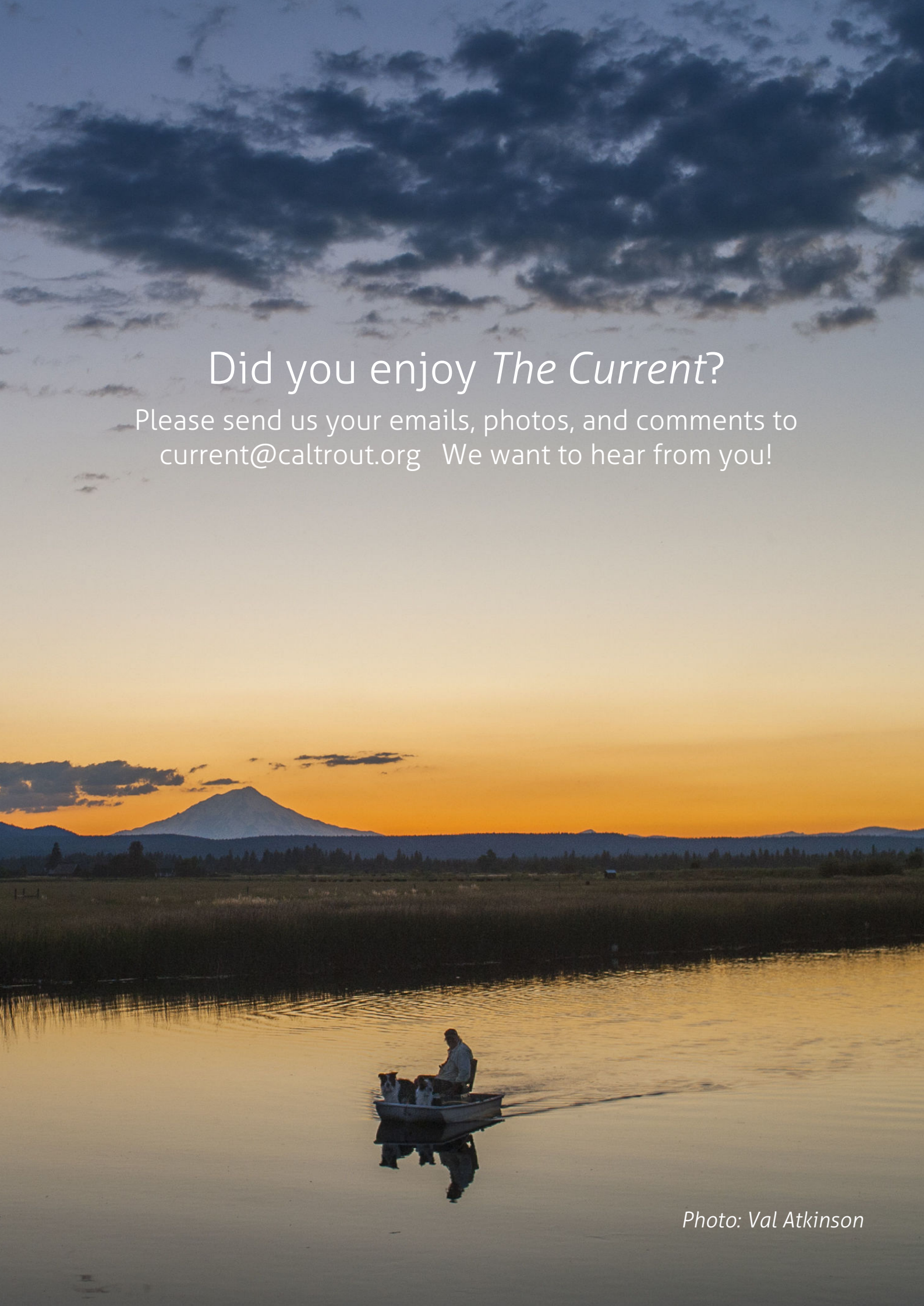

Did you enjoy *The Current*?

Please send us your emails, photos, and comments to current@caltrout.org We want to hear from you!

Photo: Val Atkinson